

Appn. No. 10/788,621

Attorney Docket No. DKT03160

**I. Listing of Claims**

1. (Currently Amended): A unitary electrohydraulic clutch assembly comprising, in combination,
  - an input member and a coaxially disposed output member defining an axis,
  - a bi-directional electric motor having an output hub,
  - means for inhibiting back driving of a said electric motor associated with said output hub and having an output,
  - a gear train having an input driven by said inhibiting means output and an output,
  - a ball screw driven by said gear train output and driving a first piston displacing hydraulic fluid,
  - an annular piston disposed on said axis and translated by said hydraulic fluid,
  - means for inhibiting rotation of said annular piston,
  - a friction clutch pack disposed on said axis and operably disposed between said input member and said output member and actuated by said annular piston,
  - a pressure sensor for providing a signal representing a pressure of said hydraulic fluid, and
  - a microprocessor having an input for receiving said signal from said pressure sensor and an output for controlling said bi-directional electric motor.

2. Cancelled.

3. (Previously Presented): The electrohydraulic clutch assembly of claim 1 wherein said inhibiting means includes a wrap spring disposed within a cylindrical

-2-



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PO Box 10395  
Chicago, IL 60611-5599

Appn. No. 10/788,621

Attorney Docket No. DKT03160

passageway and extending between said output hub and said inhibiting means output.

4. Cancelled.

5. Cancelled.

6. (Original): The electrohydraulic clutch assembly of claim 1 wherein said friction clutch pack includes a first plurality of clutch plates coupled to said input member and a second plurality of clutch plates interleaved with said first plurality of clutch plates and coupled to said output member.

7. (Original): The electrohydraulic clutch assembly of claim 1 further including a circular apply plate and a thrust bearing both disposed between said second piston and said friction clutch pack.

8. (Currently Amended): A unitary electrohydraulic clutch assembly comprising, in combination,

an input shaft and a coaxially disposed output shaft defining an axis,  
an electric motor,  
a gear train for reducing an output speed of said electric motor,  
means for inhibiting back driving of said electric motor operably disposed between said motor and said gear train,  
a master piston,

-3-



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Appn. No. 10/788,621

Attorney Docket No. DKT03160

a rotary motion to linear motion transducer driven by said gear train and driving said master piston,

a friction clutch pack operably disposed between said input shaft and said output shaft including first and second interleaved pluralities of clutch plates disposed on said axis,

an annular slave piston in fluid communication with said master piston, disposed on said axis and acting upon said friction clutch pack,

means for inhibiting rotation of said slave piston.

a pressure sensor for providing a signal representing a pressure of hydraulic fluid generated by said master piston, and

a microprocessor having an input for receiving said signal from said pressure sensor and an output for bi-directionally driving said electric motor.

9-12. Cancelled.

13. (Previously Presented): The electrohydraulic clutch assembly of claim 8 wherein said first plurality of clutch plates is coupled to said input shaft and said second plurality of clutch plates is coupled to said output shaft.

14. (Original): The electrohydraulic clutch assembly of claim 8 further including a circular apply plate and a thrust bearing both disposed between said slave piston and said friction clutch pack.



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15. (Currently Amended): A unitary electrohydraulic clutch assembly for motor vehicle drivelines, comprising, in combination,

- a bi-directional electric motor having an output hub,
- a wrap spring disposed within a cylindrical passageway and extending between said output hub and a drive pinion,
- a gear train having an input driven by said drive pinion and an output, said gear train having at least two pinion gears and two, larger spur gears,
- a ball screw assembly driven by said output of said gear train,
- a first piston bi-directionally translated by said ball screw assembly,
- an annular piston in fluid communication with said first piston,
- means for inhibiting rotation of said annular piston.
- a friction clutch pack having an input and an output and acted upon by said annular piston,
- a circular apply plate and a thrust bearing both disposed between said annular piston and said friction clutch pack
- a pressure sensor for providing a signal representing a pressure of hydraulic fluid generated by said master piston, and
- a microprocessor having an input provided with said signal from said pressure sensor and an output adapted to bi-directionally drive said electric motor.

16. Cancelled.

17. Cancelled.

-5-



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Appn. No. 10/788,621

Attorney Docket No. DKT03160

18. (Previously Presented): The electrohydraulic clutch assembly of claim 15 wherein said drive hub and said driven pinion include a coupling accommodating limited relative rotation.

19. Cancelled.

20. Cancelled.

21. (Original): The electrohydraulic clutch assembly of claim 15 wherein said friction clutch pack includes a first plurality of clutch plates coupled to said input member and a second plurality of clutch plates interleaved with said first plurality of clutch plates and coupled to said output member.

22. (Original): The electrohydraulic clutch assembly of claim 15 wherein said output of said friction clutch pack provides drive torque to a differential in a motor vehicle driveline.

23. Cancelled.

24. (Previously Presented): The electrohydraulic clutch assembly of claim 1 further including a housing configured to receive said input member, said output member, said electric motor, said back drive inhibiting means, said gear train, said ball screw assembly, said pistons and said friction clutch pack.



Appn. No. 10/788,621

Attorney Docket No. DKT03160

25. (Previously Presented): The electrohydraulic clutch assembly of claim 8 further including a housing configured to receive said input member, said output member, said electric motor, said back drive inhibiting means, said gear train, said ball screw assembly, said pistons and said friction clutch pack.

26. (Previously Presented): The electrohydraulic clutch assembly of claim 15 further including a housing configured to receive said input member, said output member, said electric motor, said back drive inhibiting means, said gear train, said ball screw assembly, said pistons and said friction clutch pack.

Please add the following new claims:

27. (New): The unitary electrohydraulic clutch assembly of claim 1 wherein said means for inhibiting rotation of said annular piston includes a blind aperture in said piston and a stationary pin extending into said aperture.

28. (New): The unitary electrohydraulic clutch assembly of claim 8 wherein said means for inhibiting rotation of said slave piston includes a blind aperture in said piston and a stationary pin extending into said aperture.

29. (New): The unitary electrohydraulic clutch assembly of claim 15 wherein said means for inhibiting rotation of said annular piston includes a blind aperture in said piston and a stationary pin extending into said aperture.

